

Farmland Consolidation in Northern Nigeria: A Scoping Review of Evidence

Suhaibu Muhammad

Department of Social Studies and Civic Education, Shehu Shagari University of Education,
Sokoto, Nigeria

suhaibu.muhammad@ssues.edu.ng

ORCID ID: <https://orcid.org/0009-0009-8137-5376>

Corresponding author: suhaibu.muhammad@ssues.edu.ng

Ibrahim Yusuf

Department of Sociology, Sokoto State University, Sokoto, Nigeria

ibrahim.yusuf@ssu.edu.ng

ORCID ID: <https://orcid.org/0009-0004-0947-7363>

Abstract

Objective: Land fragmentation is a persistent barrier to agricultural development in Northern Nigeria. This scoping review addresses a critical gap in the literature by mapping existing empirical evidence and identifying research voids regarding farmland consolidation. The study followed Arksey and O'Malley's five-step framework: identifying research questions, establishing search criteria, selecting studies, charting data, and summarising results.

Method: Six databases (Scopus, Taylor & Francis, ProQuest, SSRN, Semantic Scholar, and Google Scholar) were searched. Following eligibility screening, relevant data from qualifying journal articles were charted and synthesised to identify key themes and gaps.

Results: Four articles met the inclusion criteria. Findings indicate that consolidation in Northern Nigeria is driven by social factors, including inheritance laws, communal land norms, and poverty. Key motivations for consolidation include mitigating fragmentation to bolster food security and rural development. While consolidation facilitates mechanisation and increases farm viability for smallholders, significant research gaps remain regarding farmers' perceptions, institutional barriers, and context-specific outcomes. Specifically, studies lack a comprehensive analysis of the nexus between social, economic, and institutional factors influencing program acceptance.

Conclusion: Future research must generate empirical evidence on the drivers and outcomes of consolidation—both within and beyond Northern Nigeria—to inform policy and achieve sustainable agricultural goals.

Keywords: Agriculture, development, farmland consolidation, farmland fragmentation, northern Nigeria

Introduction

Farmland consolidation is defined as the merging, or re-organisation of ‘fragmented’ agricultural land into a larger unit (Sani et al., 2024). It is a direct response to farmland fragmentation, or the ‘parcellisation’ of land into different spatially separated plots (Abdollahzadeh et al., 2012; Obayelu et al., 2019), which leads to farm yield shortage and productivity as small-scale farmers may struggle to produce enough to meet market demands or incur higher transportation costs due to the dispersed nature of their land. The problem of farmland fragmentation is global, though it is rampant in developing countries. From Eastern Europe down to Asia and Africa, many households possess several non-contiguous plots of land, often scattered over a wide area without putting it into agricultural use (Demetriou, Stillwell & See, 2012, quoted in Ayoola et al., 2022). In Romania, for example, Rusu (2002:16) claimed that land fragmentation is a recurring phenomenon that disrupts the Romanian economy and beyond, and called for a well-articulated, coherent framework of support and consolidation plans from the policy-makers to ‘spur rural community development.’ Land fragmentation is also a source of concern in Africa. The decrease in farmland size due to subdivision has resulted in farmland holdings that do not support an average farm household for about 33 per cent of sample households in Ethiopia (Alemu et al., 2017). According to Apata (2016), about 60 per cent of rural families in Nigeria are landless and seasonal labourers; hence, he recommended that the government formulate and implement an economically viable land reform policy to ensure that farmers develop an emotional attachment to the land they cultivate. Furthermore, as Obayelu et al. (2019) observed, urbanisation and population growth are the two most important factors that cause land fragmentation. As cities and towns expand, agricultural land on the outskirts is often converted into residential, commercial, or industrial areas. This conversion process divides farmland into smaller plots to accommodate new infrastructure and developments. To this end, consolidating agricultural land is necessary, as it boosts agricultural production and productivity.

These consolidation practices can be carried out in many ways: they may occur among farm holders, who voluntarily agree to exchange farmland to boost crop production. Alternatively, the government can intervene in providing effective land reform policies that specifically promote farmland consolidation among farmers. Recent evidence has highlighted the benefits of farmland consolidation in Eastern Chinese communities, describing land consolidation practices as effective in improving ‘farmland infrastructure’ and sustaining ‘regional development’ (Lin et al., 2022, p. 1). Moreover, in an empirical study on ‘Land Consolidation in Villages,’ Wójcik-Leń (2022) found that consolidation practices of land enhance the spatial structure of rural lands in Brzozów’s villages in Poland. In Nigeria’s south-west, Adebisi et al.’s (2022) study highlighted that the optimal location of agricultural consolidation centres depends on the method used and that consolidation centres located there can reduce transportation distances and costs, thereby improving agricultural product supply capacity for both subsistence farmers and consolidators.

Existing studies on farmland fragmentation and consolidation have provided empirical evidence in Europe (Poland) (Rusu, 2002), Asia (China) (Lin et al., 2022), and Africa (the northwestern states of Nigeria) (Adebiyi et al., 2022). However, no known study has charted, collated and summarised all research evidence on farmland fragmentation in northern Nigeria. Therefore, this study aims to conduct a scoping review to address these concerns. The findings from this scoping review will provide critical insights into the patterns, drivers, and outcomes of farmland consolidation in Northern Nigeria, particularly among smallholder and subsistence farmers. The findings from this review will clarify how land consolidation practices affect agricultural productivity and livelihood security in northern Nigeria, particularly among household farmers. It will also serve as a valuable resource for agricultural planners and policymakers to engage in land administration and sustainable agricultural transformation, thereby reducing poverty and insecurity in Northern Nigeria (Muhammad, 2019).

Materials and Methods

Review Design

This paper used a scoping review, a type of systematic literature review, to review and synthesise existing data on farmland consolidation in northern Nigeria. The paper adopted Arksey and O'Malley's (2005: 22) five-step scoping review procedure, namely: identifying research questions, defining literature search criteria, selecting relevant studies, charting data, and collating results. In writing this review, the article also followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines (PRISMA-ScR).

Research Question Identification

The primary research question the current review seeks to answer is: What scientific evidence exists on farmland consolidation in northern Nigeria? Hence, to provide a more specific answer to the primary question, the paper raised three sub-questions:

- **Sub-question 1:** What scientific evidence exists regarding the predisposing social factors that influence the need for farmland consolidation in Northern Nigeria?
- **Sub-question 2:** What scientific evidence exists regarding the underlying reasons for the implementation of farmland consolidation in Northern Nigeria?
- **Sub-question 3:** What scientific evidence exists in the literature for the adoption of farmland consolidation as an agricultural development strategy in Northern Nigeria?

Literature Search

On 28 December 2025, the researcher conducted a systematic search to retrieve relevant literature on farmland consolidation in northern Nigeria from Scopus, Taylor & Francis Online (T&F), ProQuest, the Social Science Research Network (SSRN), and Semantic Scholar. To conduct a

comprehensive literature search, the researcher used relevant search terms to answer the study's research questions. Specific search terms and/or phrases and synonyms, such as 'farmland consolidation' OR 'farmland consolidation in Nigeria' OR 'farmland consolidation in northern Nigeria' OR 'farmland sustainability' AND 'Nigeria', 'north-eastern Nigeria' 'north-western Nigeria,' 'north central Nigeria' were used for the scoping review, with the help of Boolean operators AND and OR to retrieve all relevant and recent literature on the subject from the past five years (2021 to 2025).

The researcher also conducted a manual search on Google Scholar to further retrieve additional eligible studies not identified through the database mentioned above. Only the publications that met the following criteria were included in this review:

- Articles published in referred journals
- Journal articles written in the English language
- Academic articles of any type (letters, editorials, comments, original research articles, review articles, etc.) published in a reputable journal
- Journal articles reporting empirical evidence about farmland consolidation within the context of northern Nigeria
- Journal articles that can be accessed in full text.

In total, 10 journal articles were included in the scoping review. After obtaining these 10 articles from the aforementioned databases, the researcher conducted a manual de-duplication, removing identical articles from the list. Following de-duplication, the remaining literature was screened for inclusion in the scoping review, as shown in Figure 1. Only those articles that met the inclusion criteria were included in the review.

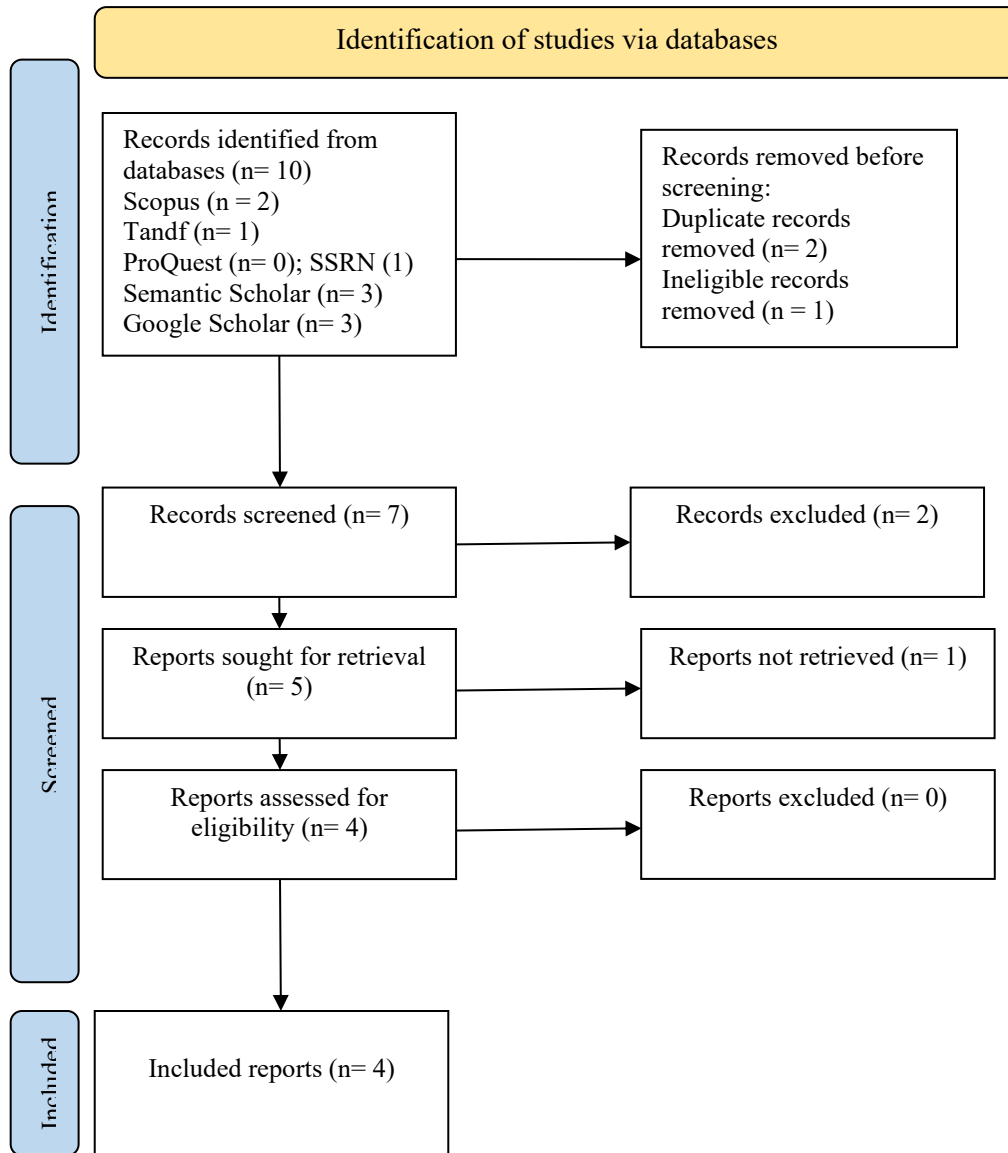


Figure 1: PRISMA flowchart diagram (Preferred Reporting Items for Systematic Reviews and Meta-analyses)

Data Extraction

We extracted the following data from the included literature: authors and publication year, study objectives, study design, participant sample, and a key summary of the major findings and/or conclusions.

Collation, Summarisation and Presentation of the Charted Data

After data extraction, we collated and summarised the charted data using a narrative synthesis approach. Afterwards, we presented the summarised data in text form (Table 1).

Literature Search, De-Duplication and Screening Outcomes

Ten research articles were retrieved from the literature search [SCOPUS (n= 2); Taylor and Francis Online = (n= 1); ProQuest = (n= 0); Social Science Research Network = (n= 1); Semantic Scholar = (n= 3); and Google Scholar = (n= 3)]. Of these studies, two were duplicates and were removed; the other three were also removed because they were ineligible or did not meet the inclusion criteria. The titles and abstracts of the remaining five publications were screened, and one non-relevant publication was excluded. The full texts of the remaining four studies were screened, and all were relevant and included in the scoping review (Figure 1).

Table 1: A brief summary of reviewed literature

S/No	Author/Year	Objectives	Study Design	Sample Size and Location	Key Summary
1	Abba et al, 2024	The objective of the article is to examine the nature of land fragmentation in Bade and propose land consolidation strategies.	Cross-sectional (mixed-method design)	30 household farmers in Bade, Yobe State	Most farmers own smaller parcels of land (between 2 and 4 hectares). There is high-level degree of land fragmentation. There is a need to consolidate fragmented landholdings to create larger, more productive farms. This can be achieved through land redistribution programs that encourage smallholder farmers to voluntarily exchange their fragmented plots for consolidated land.
2	Oyawole et al., 2021	The objective of the article is to examine how Agricultural Practices (AP) with Climate	Cross-sectional study (survey)	238 maize farmers in 5 northern states (Kaduna, Kebbi,	About 37.0% of the farm households were food insecure, and adoption of the AP-CSAPs was generally low. The study also recommends that policies are needed to

S/No	Author/Year	Objectives	Study Design	Sample Size and Location	Key Summary
		Smart Agriculture Potentials (CSAP) can enhance food security among farmers in northern Nigeria		Niger, Nassarawa, Taraba)	consolidate farmland holdings. In addition, monocropping should be considered before being introduced to rural farmers, as land fragmentation has been shown to improve food security and reduce the risk of total crop loss.
3	Sani et al., 2024	The objective of this article is to analyse the practice of land exchange and its effect on farmers' performance in north-eastern Nigeria.	Quantitative study	400 rice farmers in north-eastern Nigeria	The practice of land exchange did not affect the technical efficiency of rice farmers in northeastern Nigeria due to a limited land market and high crop diversification. Therefore, policymakers are encouraged to define land use rights and promote land transactions, such as renting, selling occupancy rights, and transferring leasehold rights, to enhance land efficiency and strengthen land consolidation.
4	Okuta et al., 2022	The objective of the paper is to assess the productivity and property rights to land use among IFAD/VCDP rice farmers in Gwer.	Survey design	120 rice farmers in the Gwer Local Government Area, Benue State.	Rice farmers in the Gwer local government area face major constraints, notably limited access to mechanised farming technologies and adverse weather conditions. In addition, insecure land tenure remains a significant barrier to agricultural development. To address this challenge, the study recommends a fair redistribution of available

S/No	Author/Year	Objectives	Study Design	Sample Size and Location	Key Summary
					land among IFAD/VCDP farmers through land tenure reform and land consolidation.

Source: Authors

RESULTS

Publication Trend

All the included journal articles were published in English within the last five years. All four papers included in the study were journal articles, all recently published. The first article was published in 2024 (Abba et al., 2024); the second in 2021 (Oyawole et al., 2021). The third was published in 2024 (Sani et al., 2024), and the fourth in 2022 (Okuta et al., 2022), as illustrated in Table 1.

Study Design

Aside from one article that used a mixed-method design (Abba et al., 2024), the last three papers adopted a quantitative cross-sectional study design (Oyawole et al., 2021; Sani et al., 2024; Okuta et al., 2022). As it happens, none of the included articles adopted an experimental or qualitative study design (Table 1). Moreover, with the exception of one article, which did not specifically detailed the specific northern Nigerian states it studied (empirical setting) (Sani et al., 2024), the rest of the three papers have clearly identified the specific empirical setting that they conducted their empirical study: Oyawole et al's (2021) study was conducted in five northern states (Kaduna, Kebbi, Niger, Nassarawa, Taraba); Abba et al's (2024) study was conducted in a north-eastern state of Yobe; and Okuta et al's (2022) study was conducted in a north central state of Benue (Table 1).

Research Question 1: Social Factors Influencing the Need for Farmland Consolidation in Northern Nigeria

Only one paper provided evidence of the predisposing social factors necessitating farmland consolidation in northern Nigeria (Okuta et al., 2022). The paper utilised a survey design involving 120 rice farmers in Gwer, Benue State, Nigeria. The study noted social and economic challenges that impede farmers' productivity in the state, including a shortage of land due to land tenure issues, limited access to mechanised farming, and unfavourable climate and weather conditions. According to Okuta et al. (2022), all of these social factors influence the need for land consolidation to facilitate fair land redistribution and to introduce other vital policy measures.

Research Question 2: Reasons for the Implementation of Farmland Consolidation in Northern Nigeria

In all four articles included in this review, one article by Abba et al. (2024) found evidence for the rationale behind the implementation of farmland consolidation in northern Nigeria. According to this study, most farmers own smaller parcels of land (between 2 and 4 hectares), which requires consolidation of fragmented land holdings to acquire or rent larger farmland for food security and agricultural development.

Research Question 3: Adoption of Farmland Consolidation as an Agricultural Development Strategy in Northern Nigeria

A study provided evidence of the adoption of farmland consolidation as an agricultural development strategy in northern Nigeria (Sani et al., 2024). The paper introduced land exchange, a specific consolidation practice, as an important strategy that the government should encourage in northern Nigeria and beyond. According to the study, doing so will promote land consolidation measures, such as renting land, selling occupancy rights, and transferring leasehold rights, to enhance land efficiency and agricultural productivity in northern Nigeria and beyond.

Discussion

This scoping review is believed to be the first study to collate all available information on farmland consolidation in northern Nigeria. As it is indicated in the results section, only four articles were identified in the current review, despite the systematic search strategy employed. This limited number of studies does not indicate a weakness in the review process; it only reveals a research desert in agricultural land policy in Nigeria. One of the primary objectives of a scoping review is to map the extent and nature of available evidence, and the findings of this review clearly demonstrate a substantial gap in the literature on farmland fragmentation in northern Nigeria.

Thus, this review identified several social factors influencing the need for farmland consolidation in Northern Nigeria, including population growth, customary inheritance practices, land fragmentation, communal land tenure arrangements, and persistent rural poverty (Okuta et al., 2022). These social conditions have continued to encourage the subdivision of farmland across generations, consistently leading to greater land parcellation that limits agricultural productivity and restricts farmers' ability to invest in improved farming practices. As noted by Okuta et al. (2022), entrenched family-based land inheritance systems and communal ownership norms persist, thereby reinforcing the need for farmland consolidation in the region.

In comparing these findings with evidence from other agrarian settings in sub-Saharan Africa, the review suggests that while land fragmentation linked to inheritance systems and demographic pressure is widely reported, few studies have explicitly examined farmland consolidation as a social necessity in Northern Nigeria. Much of the existing literature frames consolidation as a technical or policy-oriented intervention, with limited engagement with the social relations and

cultural institutions that shape landholding patterns (Okuta et al., 2022). This indicates that the social foundations of land fragmentation and consolidation remain insufficiently examined within the regional context. This gap highlights the need for further empirical research that places social realities at the centre of debates on farmland consolidation in Northern Nigeria.

Moreover, our study identified several reasons for implementing farmland consolidation in Northern Nigeria. For example, there is a need to address persistent land fragmentation and improve agricultural productivity (Abba et al., 2024). Rapid population growth and the continuous subdivision of farmland through inheritance systems have produced small and scattered plots that are increasingly unsuitable for productive farming. Abba et al. (2024) argue that farmland consolidation is viewed as a strategic response to these challenges, particularly as fragmented holdings raise production costs, limit economies of scale and reduce farmers' capacity to adopt mechanisation and improved agricultural technologies. In the same vein, studies by Deininger et al. (2019) and the Food and Agriculture Organisation (FAO, 2023) found similar results, emphasising that consolidation initiatives are mainly driven by the need to improve land-use efficiency, strengthen food security, and promote sustainable agricultural intensification in regions characterised by smallholder dominance. However, the literature remains limited in situating these motivations within the distinct socio-economic and institutional realities of Northern Nigeria.

It is noteworthy that farmland consolidation is increasingly promoted in Northern Nigeria as a response to fragmented landholdings and declining farm productivity (Abba et al., 2024; Sani et al., 2024). Consolidation is viewed as a mechanism for creating economically viable farm sizes that can support mechanisation and facilitate access to modern inputs. Both government and development agencies emphasise their role in enhancing agricultural productivity and, especially, in promoting rural development (Okuta et al., 2022). This strategy is particularly significant in Northern Nigeria, where small plots of land limit the application of modern farming techniques and reduce economies of scale. Comparing these findings with evidence from other developing regions in Asia, similar patterns emerge.

Alemu et al. (2017) highlight that farmland consolidation has been widely adopted as a policy tool to improve land-use efficiency, strengthen smallholder productivity and reduce rural poverty. FAO (2023) also notes that consolidation facilitates better land management, increases access to extension services and encourages cooperative farming arrangements. Despite these benefits, empirical research on the adoption process in Northern Nigeria remains limited, particularly regarding farmers' perceptions, socio-cultural barriers, and institutional challenges that affect uptake (Sani et al., 2024). This indicates that understanding consolidation as a development strategy requires careful attention to local social and institutional realities (Muhammad, 2025). This gap underscores the need for further research on the adoption processes and outcomes of farmland consolidation in Northern Nigeria. Issues such as community acceptance, gendered access to land, land tenure security and the effectiveness of governmental support mechanisms require empirical investigation. Policymakers, development practitioners and research institutions should prioritise studies that explore how socio-economic and institutional factors interact to

facilitate or constrain the adoption of consolidation initiatives (Obayelu et al., 2019; Deininger et al., 2019). Such evidence is crucial for ensuring that consolidation programs are effectively designed and capable of delivering sustainable improvements in agricultural productivity and rural livelihoods.

Conclusion

This review has described the available information on farmland consolidation in Northern Nigeria and highlighted several research gaps, particularly regarding social factors, the reasons for implementation, and its adoption as an agricultural development strategy. The review has identified social determinants influencing consolidation, which include population pressure, customary inheritance practices, communal land ownership norms, rural–urban migration, and persistent poverty. It has also outlined the main reasons for implementing consolidation, including improving agricultural productivity, addressing land fragmentation, enhancing efficient land use, and supporting food security and rural development. Similarly, the adoption of farmland consolidation as a development strategy has been examined in this article, showing that while it is promoted to create viable farm sizes and strengthen smallholder productivity, empirical studies on farmers’ perceptions, socio-cultural barriers and institutional challenges remain scarce. There is limited evidence on the trends of farmland consolidation adoption and its effectiveness in Northern Nigeria. There is also a lack of comprehensive studies that examine the interplay of social, economic, and institutional factors shaping farmers’ acceptance of and responses to consolidation programs. Despite the topic's relevance, only four articles met the inclusion criteria, suggesting the subject remains under-researched. Therefore, future research should focus on generating empirical evidence on both the drivers and outcomes of farmland consolidation beyond northern Nigeria to inform policy and programme design.

REFERENCES

- Abba, S., Hassan, Y., & Bulama, L. (2024). Land as a common resource: Fostering rural social sustainability in the face of fragmentation and rural social sustainability in Bade, Yobe State, Nigeria. *Revista Ciência Geográfica*, 28(1), 12–27.
- Abdollahzadeh, G., Kalantari, K., Sharifzadeh, A., & Sehat, A. (2012). Farmland fragmentation and consolidation issues in Iran; an investigation from landholder's viewpoint. *Journal of Agricultural Science and Technology*, 14(7), 1441–1452.
- Adebiyi, S., Ekpudu, J., & Awe, O. (2022). Locating consolidation centres for aggregation of subsistence agricultural products from the southwestern region of Nigeria. *Journal of Transportation and Logistics*, 7(2), 405–430.

- Alemu, G. T., Berhanie Ayele, Z., & Abelieneh Berhanu, A. (2017). Effects of land fragmentation on productivity in Northwestern Ethiopia. *Advances in Agriculture*, 2017, Article 4509605. <https://doi.org/10.1155/2017/4509605>
- Apata, T. (2016). *Small farms and agricultural productivity in Nigeria: Empirical analysis of the effects of land tenure, fragmentation and property rights* [Conference paper/Technical report]. [Publisher/Organization].
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32. <https://doi.org/10.1080/1364557032000119616>
- Deininger, K., Savastano, S., & Xia, F. (2019). Smallholders' land access in Sub-Saharan Africa: A new landscape? *Food Policy*, 85, 1–14. <https://doi.org/10.1016/j.foodpol.2019.03.002>
- Demetriou, D., See, L., & Stillwell, J. (2012). A spatial multi-criteria model for the evaluation of land redistribution plans. *ISPRS International Journal of Geo-Information*, 1(3), 272–293.
- Food and Agriculture Organization of the United Nations. (2023). *Land consolidation: Improving land management and agricultural productivity*. FAO.
- Lin, Y., Ye, Y., Liu, S., Wen, J., & Chen, D. (2022). Effect mechanism of land consolidation on soil bacterial community: A case study in eastern China. *International Journal of Environmental Research and Public Health*, 19(2), 845. <https://doi.org/10.3390/ijerph19020845>
- Muhammad, S. (2019). Bad governance as boon to youth unemployment and political violence in Nigeria: The public sphere perspective. *International Journal of Social Sciences and Humanities Review*, 9(2), 143–152.
- Muhammad, S. (2025). The effects of digital entrepreneurship on the knowledge economy in Nigeria: A scoping review. *Gombe Journal of Administration and Management*, 8(1). <https://journals.gjbeacademia.com/index.php/gjam/article/view/992>
- Obayelu, A. E., Ogunmola, O. O., & Oyewole, K. J. (2019). Land fragmentation and its determinants in Nigeria: A case study of smallholder farmers in Ikenne Agricultural Zone, Ogun State, Nigeria. *Journal of Agribusiness and Rural Development*, 2(52), 147–155. <https://doi.org/10.17306/J.JARD.2019.01135>
- Okuta, D. S., Omede, U. D., & Tsue, P. T. (2022). Productivity and property right to land use among IFAD/VCDP rice farmers in Gwer Local Government Area of Benue State of Nigeria. *Gujarat Journal of Extension Education*, 33(2), 112–118.

- Oyawole, F. P., Dipeolu, A. O., Adebayo, M. S., Abiodun, E. O., & Fabunmi, T. O. (2021). Adoption of agricultural practices with climate smart agriculture potentials and food security among farm households in northern Nigeria. *Open Agriculture*, 6(1), 164–177. <https://doi.org/10.1515/opag-2021-0215>
- Rusu, M. (2002). *Agricultural land fragmentation and land consolidation rationality*. [Publisher/Institution Name].
- Sani, M., Ayoola, J. B., Fani, D. C. R., Ayoola, G. B., Sani, R. M., & Henrietta, U. U. (2024). Land exchange practice and technical efficiency of rice farmers in North-eastern zone of Nigeria. *Western Balkan Journal of Agricultural Economics and Rural Development*, 6(1), 25–47.
- Wójcik-Leń, J. (2022). Identifying villages for land consolidation: A new agricultural wasteland concentration indicator. *Sustainability*, 14(24), 16865. <https://doi.org/10.3390/su142416865>